

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
26 June 2003 (26.06.2003)

PCT

(10) International Publication Number  
**WO 03/052375 A2**

(51) International Patent Classification<sup>7</sup>: G01N

(21) International Application Number: PCT/US02/24911

(22) International Filing Date: 6 August 2002 (06.08.2002)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
60/310,652 6 August 2001 (06.08.2001) US

(71) Applicant (*for all designated States except US*): **VAN-  
DERBILT UNIVERSITY** [US/US]; 1207-17th Avenue  
South, Suite 210, Nashville, TN 37212 (US).

(72) Inventors: and

(75) Inventors/Applicants (*for US only*): **WIKSWO, John,  
P.** [US/US]; 1025 Manley Lane, Brentwood, TN 37027  
(US). **BAUDENBACHER, Franz, J.** [US/US]; 182 North  
Berwick Lane, Franklin, TN 37069 (US). **MCGUINNESS,  
Owen** [US/US]; 8356 Carriage Hills Dr., Brentwood, TN  
37027 (US).

(74) Agent: **DAIGNAULT, Ronald, A.**; Merchant & Gould  
P.C., P.O. Box 2903, Minneapolis, MN 55402-0903 (US).

(81) Designated States (*national*): AE, AG, AL, AM, AT (util-  
ity model), AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA,  
CH, CN, CO, CR, CU, CZ (utility model), CZ, DE (util-  
ity model), DE, DK (utility model), DK, DM, DZ, EC, EE  
(utility model), EE, ES, FI (utility model), FI, GB, GD, GE,  
GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ,  
LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN,  
MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD,  
SE, SG, SI, SK (utility model), SK, SL, TJ, TM, TN, TR,  
TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (*regional*): ARIPO patent (GH, GM,  
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),  
Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),  
European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE,  
ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK,  
TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ,  
GW, ML, MR, NE, SN, TD, TG).

**Published:**

— without international search report and to be republished  
upon receipt of that report

*For two-letter codes and other abbreviations, refer to the "Guid-  
ance Notes on Codes and Abbreviations" appearing at the begin-  
ning of each regular issue of the PCT Gazette.*

(54) Title: DEVICE AND METHODS FOR MONITORING THE STATUS OF AT LEAST ONE CELL

(57) Abstract: A device and methods for monitoring status of at least one cell, wherein the cell has a membrane forming a substan-  
tially enclosed structure and defining an intracellular space therein. In one embodiment of the present invention, the device includes  
a first substrate having a first surface and an opposite second surface, a second substrate supported by the first substrate, the second  
substrate having a first surface, an opposite second surface, a body portion between the first surface and the second surface, a first  
side surface and an opposite second side surface, wherein the body portion defines a first passage between the first side surface and  
the second side surface and an opening on the first surface of the second substrate and in fluid communication with the first passage,  
and sidewalls positioned above the first surface of the second substrate. In one operation mode, when a first medium is introduced  
into the first passage, the intracellular space of the cell is in fluid communication with the first passage with the first medium, a  
sensor measures the response of the cell to the first medium.

WO 03/052375 A2